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Rail Road News.

Accident on the Erie Railroad.

On Wednesday, the 31st ult., while the down freight train was crossing the iron bridge three miles above Lackawaxen, it gave way, precipitating the train into the creek. The train was very heavy, consisting of 20 cars, with 500 sheep, 200 hogs, and 100 head of cattle Only 25 of the cattle and 100 sheep were saved. Five men were killed—3 brakemen and 2 drovers. When the locomotive came on to the bridge, the engineer felt it settle, when he at once put on more steam, which carried the engine over, but the tender parted, falling down into the ravine, and fifteen of the freight cars tumbled down on the top of it.—The loss is about $10,000 in property—the lives of the men being above valuation. The bridge was 62 feet long and 25 feet high. Iron bridges should be built with the greatest of care, and after they are built they require to be examined almost every day.

Girard and Mobile Railroad.

The survey of this road has been completed, and the eastern terminus fixed at Girard, Ala., opposite Columbus, Georgia. The length of this road will be 250 miles, and will pass through a very fertile country; the gradients will not exceed 43 feet per mile. The South is going ahead in railroads—they will be the means of drawing out the great natural resources of the Southern States.

Baltimore and Ohio Railroad.

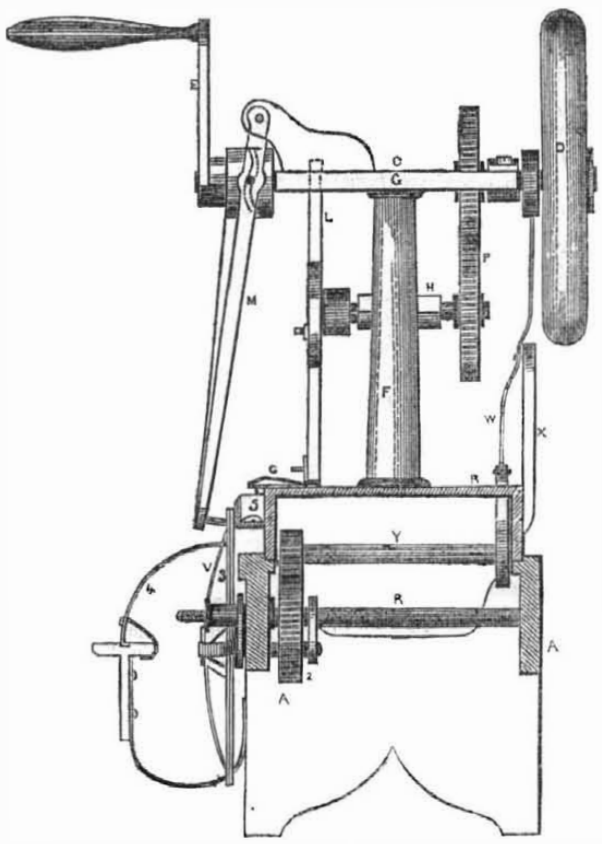
The Wheeling Gazette states the Board of Engineers to decide the questions at issue between that city and the Baltimore and Ohio Railroad company, have completed the reconnoissance of the two routes, and adjourned to West Point to conclude the examination of their minutes.

The Supreme Court of the third judicial district of New York, has decided that an action on the case lies against a railroad company in favor of a church corporation for a nuisance, in running cars and engine, ringing bells, blowing off steam and making other noises in the neighborhood of a church or meeting house, on the Sabbath and during public worship, which so annoy and molest the congregation worshiping there as greatly to depreciate the value of the house and render it unfit for a place of public worship.

The Siamese Twins.

The report that the Siamese twins had died in Europe, significantly contradicted by a letter from their place of residence in North Carolina, announcing that one of their wives has just ushered into the world "another pledge of their union," making the ninth added to census by the Mesdames Chang and Eng. We verily believe these Siamese twins have as many lives as a cat. They have died two or three times already and we don't know but they will have to die as many times more before they give the final kick.

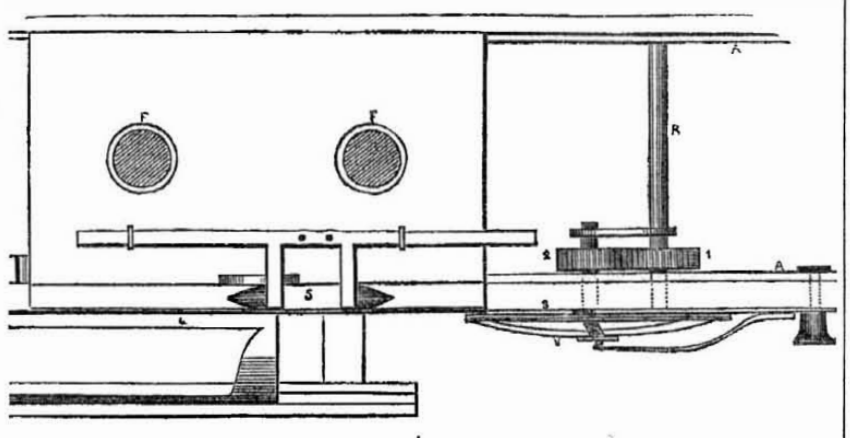
WATSON'S SEWING MACHINE.---Fig. 1.



Four different sewing machines have already been published in our columns, and we now present another, which produces work of a very superior character; it is the invention of Mr. William C. Watson, of Paterson, N. J., who has made application for a patent. This machine uses two threads to form the stitch, the one thread by a shuttle and the other by a needle—the motion of the two being regulated to form a lock-stitch, which will not rip out. It produces one stitch during the forward and another during the backward motion of the shuttle. The manner in which the cloth is fed in to sew curved seams, is beautiful.

Figure 1 is a vertical transverse section; figure 2 is part of a plan view; figure 3 is a detached longitudinal vertical section. The same letters of reference indicate like parts. A is a long table, which supports the machinery; B is the bed plate, smoothed to fit into the table. There are two pillars, F F, to support plates and shafts; G is a top plate, and H is an intermediate one; C is the main shaft, and D is a fly wheel on it. E is a crank handle. There is a cylinder on the main shaft, having an eccentric groove in it (shown by the dotted lines.) This eccentric groove operates the forked arm, M, of the needle, which has pins in it inserted in the groove, which gives an out and in motion to the needle, when the

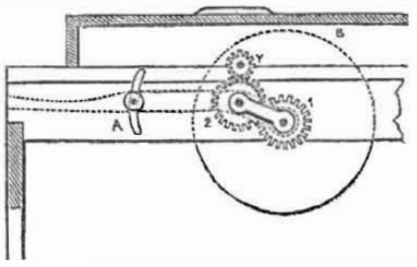
Figure 2.



handle, E, is turned. On the other side of the fly wheel there is a cam for operating the ratchet arm, W, which has a pall on its lower end to take into a ratchet wheel on the spindle below and turn it. P is a pinion on the small horizontal shaft, which is turned by a cog-wheel on the main shaft above. L is a lever which hangs down to vibrate and operate the shuttle bar backwards and forwards. The spool is not seen, but the thread is shown passing behind the needle arm, M. The needle is at the lower end. The shuttle, 5, is like a weaver's, and is moved backwards and forwards, as on a loom. The bar on the plate, fig. 2, has two spring fingers embracing the shuttle in its raceway, and there is a pin on the inside of each finger. There are two pins on the bar above the shuttle, between which is embraced the vibrating lever, L, fig. 1, therefore when the said lever is vibrated, the shuttle bar is moved backwards and forwards—once backwards and once forwards, for every two stitches of the needle. The pins on the inside of the fingers must be lifted when the shuttle is passing through the loop, G, fig. 1 (formed by the thread of the needle behind the cloth) and this is done by a projection on the plate, above the shuttle behind the fingers. Each finger is thrown out alternately, so that one holds the shuttle while the other is free, and thus the shuttle passes through the needle loop, forming the lock stitch. This is the way the shuttle is operated.

The feed motion of the cloth to be sewed is peculiar—two circular plates being employed for that purpose, (the edges of them only are seen in the figures.) R is a spindle which carries a toothed wheel loose upon it, and there is a small spindle with a fast wheel, 2, upon it. The outer end of this small spindle carries the flat round plate, 3, which can be adjusted to different heights, to suit the sewing of large and small garments, &c. V is a circular plate, concave on the inside, and is of the same size as plate 3. The cloth is confined between these two plates, the concavo part allowing for the folds, so that any curved seam may be arranged on the periphery, packing the folds inside, and as these plates revolve, the needle passes through the cloth at the edge, and thus sews circular, or any kind of curved seam. In figures 1 and 3 there is a spindle, Y, with a pinion on it gearing into wheel 2. This spindle has a ratchet wheel on it which is operated by the ratchet arm, W, which is hung on a centre pin on the post, X, and thus motion is given from the main shaft above to the spindles Y and R below, to give the plates 3 and V a rotary motion to feed the cloth to the needle, and this is done at regular stitch distance for every stroke. For sewing straight seams, a different cloth-holder is used, but this needs no explanation, such an arrangement being easily constructed. For sewing curved seams, it will easily be perceived how Mr. Watson has exercised a beautiful ingenuity. The one round plate being open concave, and the other flat, allows a seam of any curve to be arranged to the action of the needle, and

Fig. 3.



the two plates are then pressed together by a spring on the bow plate, 4, fig. 1, to hold the cloth snugly between the plates.

When the main shaft, C, is revolved, the needle arm is vibrated by the eccentric grooved cylinder, the cam works the ratchet arm, W; the lever, L, gets its vibratory motion likewise from a crank pin on the spindle of the pinion, P, which works in a slot in the lever, and thus the vibratory and rotary motions, to work the needle, shuttle and revolving plates are derived from the main shaft, C, when the crank handle, E, is turned by the operator.

Several of these machines are nearly finished at the American steam works, in this city. Persons desirous of seeing them can be gratified by calling upon Messrs. Jones & Lee at Earle's Hotel, No. 19 City Hall Square.

Glaze for Muslin.

Three pints of old pale linseed oil; sugar of lead, one oz; and white resin four oz. The sugar of lead must be ground with a small quantity of the oil, and, added to the remainder, incorporated with the resin by means of a gentle heat. Lay it on muslin with a brush. One coat annually is sufficient.

Covering for Gravel Walks.

Decomposed sandstone is an excellent covering for walks, in order to bind any loose material of which they may be formed. Soon after its application, the surface becomes perfectly smooth, and almost as firm as a flag.—The walks may be swept during wet weather, nearly as well as when it is dry.

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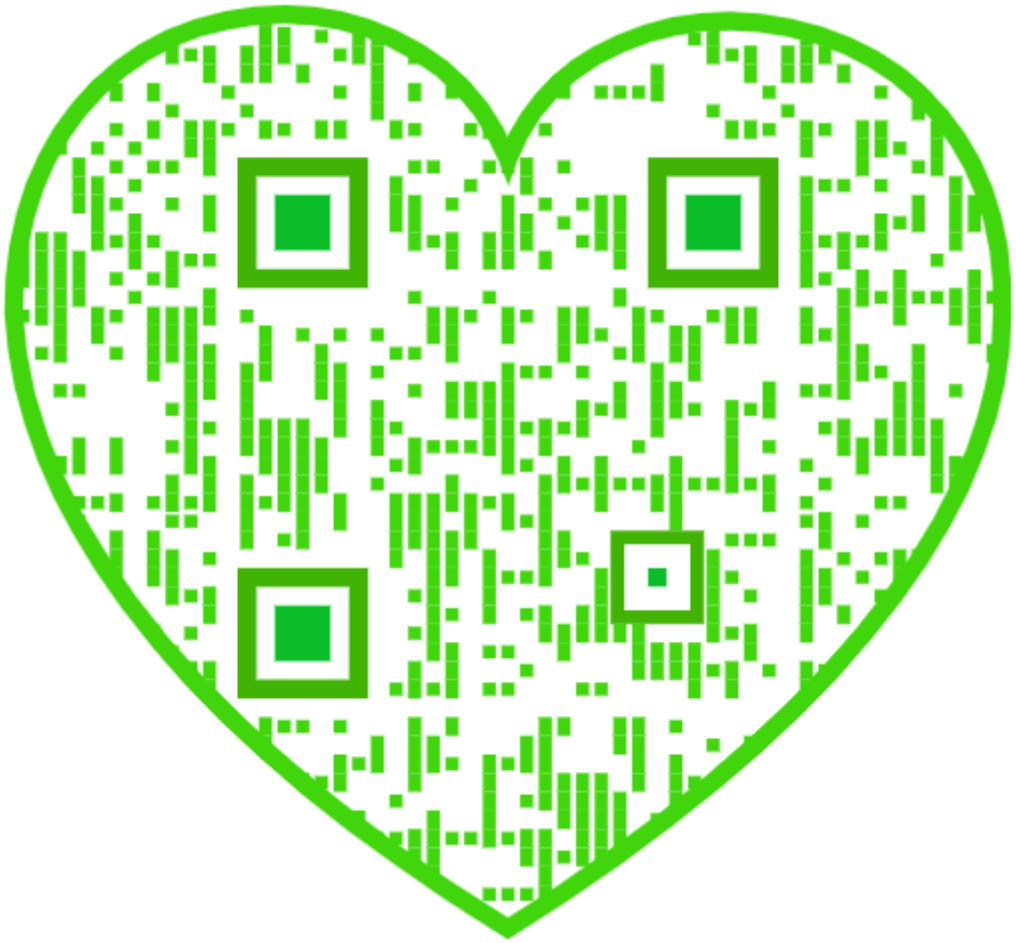

Miscellaneous.

Errors in Cooking

Dr. Drake of Cincinnati, in a late treaties on the principal diseases of the interior valley of North America, gives the following enumeration of the vicious modes of cooking which prevail in the valley :

1. With the mass of our population, bread of every kind is apt to be baked too soon after the flour or meal has been wetted—that is, before there has been sufficient maceration. But what is still worse, it is scarcely ever baked enough.

2. Biscuits, as they are called, are baked in close ovens, by which process the fat they contain is rendered empyreumatic and indigestible.

3. When the dough for leavened bread, by excess of panary fermentation, has been charged with acetic acid, that product is not in general neutralized by the carbonate of potash or soda, but the bread is eaten sour.

4. Pastry, instead of being flaky and tender, is often tough and hard, sometimes almost horny.

5. Meats are often baked and fried, instead of being rosted or broiled, whereby they become impregnated with empyreumatic oil, and not unfrequently charred on the outside. In general, they are overcooked.

5. Fresh Meat, and especially poultry, are commonly cooked too soon after death.

7. Soup is often prepared from parts deficient in gelatine, and abounding in fat, which swims upon the surface, and is much more indigestiole than the meat would have been, if eaten in the solid form.

8. Eggs are generally boiled so hard as to render them tough, and many are often fried in fat, to a still greater degree of induration.—Fried bacon and eggs eaten with hot unleavened biscuit, containing lard, and then buttered, is a favorite breakfast in many parts of the valley.

9. Vegetables, abounding in fecula, such as potatoes, rice and pulse, are often boiled so little, that all the starch grains are not burst open ; while those containing albumen, as cabbage, are boiled until that element is firmly coagulated and deposited in the structure of the leaf.

Mr. Ewbank.

A correspondent to the Journal of Commerce mentions Mr. Ewbank as among those whose nominations will probably be rejected by the Senate. We think this is a mistake, and we are certain it ought to be. Mr. Ewbank is undoubtedly one of the very best men in the country for the place which he holds. His report has been more generally read and has better deserved reading, than any other which has come from that office, and his plans for the interests of inventors, and for the encouragement of ingenuity and the appplication of scientific knowledge to practical life, have received universal commendation. Mr. Ewbank has incurred the hostility of a class of men at Washington who have long been in the habit of preying upon inventors, and who are indignant towards him for stepping between them and their accustomed victims. We do not believe, that these men can influence the Senate to the rejection of an officer so able and so faithful as Mr. Ewbank.

[The above is from the "Farmers and Manufacturers Journal," Providence, R. I. Those journals which charge Mr. Ewbank falsely for any thing whatever, are guilty of a great sin, and so are those which charge others falsely for any purpose whatever.

Commonplace Talk.

Fuseli, the painter, had a great dislike to commonplace observations. After sitting perfectly silent for a long time, in his own room, during the "bald disjointed chat" of some idle callers-in, who were gabbling with one another about the weather and other topics of as interesting a nature, he suddenly exclaimed, "We had pork for dinner to-day!" "Dear! Mr. Fuseli, what an odd remark!" "Why, it is as good as anything you have been saying for the last hour."

The Danger of Giving the Wrong Medicine.

Two weeks ago Mr. James Hall, of this city, was poisoned by taking a dose of *corrosive sublimate*, put up by an apothecary in mistake for calomel. Had Mr. Hall, or any other person, known in season that he had taken corrosive sublimate, he could have been cured by administering the white of eggs. Many have been poisoned by oxalic acid for epsom salts, which resemble one another. The antidote for oxalic acid is magnesia or chalk. It is very wrong for apothecaries to have their bottles and drawers labelled with nonsensical Therapeautic terms of Tinc. Schillæ, Arsenic Oxydi—and so on. Boys who are not chemists may very readily make mistakes in putting up prescriptions, for doctors deal more in poisons than puddings, excepting in their own families. There used to be a great deal of *hoc shoc*, *hocus pocus*, in the administration of medicines in olden times, and the doctors wrap up the same *mysterious* knowledge in the same *mysterious* words now, all to give an air of deep learning to a dose of salts or a gargle of alum.

Espy's Theories.

A correspondent of the Philadephia Ledger mentions a fact, which he himself observed, and which corroborates the theory of Prof. Espy, that a very large fire will invaribly, by a rapid rarefaction of atmosphere, cause an upward current, which must necessarily draw in from the surrounding atmosphere near the surface. He says :

"From 3 until 9 o'clock, and later, the strong southeast wind carried the flakes of fire and flame to neighboring buildings. and then it appeared as though all the northern part of the city must be destroyed. At half-past ten o'clock I noticed the sparks ascending more perpendicularly and to a greater height; many assuming a spiral motion ; and then I immediately made a circuit of the fire, and found the wind blowing strongly in from every side ; and one hour after the fire was under control; but not under the firemen's control. Nature accomplished what all the firemen in the Union could not do."

Site of Paradise.

Col. Chesney, who cammanded an expedition, sent, a few years back, by the British government, to explore the Euphrate's, has introduced into his narrative, recently published, speculations on the probable site of Paradise, which he believes he has satisfactorily ascertained to be Central Armenia ; and "the Land of Eden" is there actually laid down on the index map. He identifies the Halys and Araxes, whose source exist within a short distance of the Euphrates and Tigris, with the Pisgon and Gihon of Scripture, while he considers the country within the Halys as the land Havilah, and that which borders on the Araxes, as the remarkable and much disputed territory of Cush.

Rejoice not at Misfortune.

Never rejoice at another's misfortune because it may turn out to your advantage. In some parts of Germanny they make use of the saying "my corn is ripening," which a person will repeat who has the prospect of something profitable occuring to him. Once while a surgeon and carpenter were taking a walk together, they observed at some distance a small village, known to them both, on fire. The carpenter pointed to it, and said to his companion, "my corn is ripening," for he concluded that if the old houses were burned new ones would require to be built ; but, as he looked intently at the conflagration and not at the road, immediately after saying this he fell into a ditch and broke his arm. "Ah!" said the surgeon, 'it appears to me that my corn is already ripe.'

A High Authority.

Mr. Curran was once engaged in a legal argument; behind him stood his colleague, a gentleman whose person was remarkably tall and slender, and who had originally intended to take orders. The Judge observing that the case under discussion involved a question of ecclesiastical law, "Then," said Curran, "I refer your lordship to a high authority behind me, who was once intended for the Church, though in my opinion he was fitter for the steeple."

Artificial Legs.

We have received a communication from a correspondent, on this subject, relating his own experience in the matter, which we here insert to speak for itself :—

"In an engagement at Cherubusco, Mexico, on the 20th August, 1847, I had the misfortune to lose a leg, amputated within four and a half inches of my hip joint. Soon after my limb got well I returned to Philadelphia, where I purchased an artificial leg made upon the Skeleton plan, of iron and steel. With it I was enabled to go (though I can hardly say walk), and, for a time, confess that I supposed it to be the best false limb I could get.

I had never seen an artificial leg of nay approved make up to this time. This leg, the manufacturers said, was much lighter and better than any other, and they not only said to me, but published it, that the leg made for me weighed only 43 ounces. After returning home, thinking it must be heavier than they said, as well as uncouth, I weighed it and found it to be 85 ounces. Notwithstanding its great weight it was continually breaking, causing much expense to keep it in repair; it costing me some sixty dollars for the thirteen months I had it. Just as I had become fully satisfied that it was a perfect failure, a friend procured one of Palmer's Patent Legs, and surprised me by walking in the most perfect manner with it on. I immediately ordered one from the establishment of Messrs. Palmer & Co., Springfield, Mass., and now take great pleasure in stating that I now wear it, and find it all I had hoped in the Skeleton Leg. And while I recommend Palmer's Leg in the strongest terms, a sense of the duty I owe to the unfortunate constrains me to condemn the Metallic Skeleton Leg. The leg I now wear weighs less than four pounds, and is the acme of perfection : in short it is nothing less than Palmer's ingenious mechanism, which is too well known to need further praise. JACOB T. SMITH,

Fort Keeper,—Fort Knox, Bucksport, Me.

Passengers over the Hungerford Suspension Bridge

Mr. Stephenson, in the late parlimentary discussion in reference to the site of the exhibition of 1851, took occasion to state that, in fine weather, fifteen thousand persons passed every day over Hungerford suspension bridge (the narrowest and least easily accessible bridge in the metropolis,) and through a turnstile, paying toll, without producing any inconvenience, and, in addition, twenty-five thousand passengers per day departed from or arrived at one of the piers of that bridge, in connection with the steamboat, on the river. A free passage was thus given on the narrow bridge without inconvenience to forty thousand persons daily.

Velocity of Electricity.

M. M. H. Fizeau and E. Gounelle, of Paris, have recently been making experiments by a new method to determine the velocity of the propagation of electricity.

Their experiments were made upon the wires of the electric telegraph, from Paris to Rouen, and from Paris to Amiens. The former 175 and the latter 195 miles in length. The following were their results :—

In an iron wire sixteen hundredths of an inch in diameter, electricity is propagated with a velocity of 62,159 miles per second.

In a copper wire one tenth of an inch in diameter, the velocity was 111,886 miles per second.

Every Man his own Physician.

A young gentleman of studious habits named Hind, died in London, recently, from the effects of a dose of turpentine and quicksilver, which he had taken from a prescription in a pamphlet entitled "Every Man his own Physician," as he laboured under a hallucination that he had a tapeworm, which gnawed at his liver.

Oil Cloth Manufacture.

There is a factory now in full operation at Cleveland, Ohio, which turns out five hundred yards of oil cloth per day. The article is said to be of the most durable quality and beautiful texture.

Mechanics' Fair.

The Second Annual Fair of the South Carolina Institute for the promotion of Art, Mechanical Ingenuity, &c., will open on the 18th of November next, at Charleston, continuing during the week. Selections are to be made from the best specimens of mechanism, arts, cotton, rice, sugar, tobacco, corn, wheat, flour, rosin and turpentine—to be sent to the World's Fair, to be held in London next spring. Communications should be addressed to James H. Taylor. All articles must be directed to L. M. Hatch.

Patent Suit--Parker's Water Wheel.

A correspondent writing us from Illinois, under date of the 29th ult., says "that an important suit was decided in the United States Circuit Court, last week, at Chicago, for an infringement of a patent right, Parker vs. Hoyt, in favor of the defendant, which tests the principle of his invention." He adds that the experiments made by Parker, at the time, were not satisfactory.

American Scientific Association.

The next meeting of the American Association for the advancement of science, will be held in New Haven, Conn., commencing on Monday, August 19th, 1850, at 2½ o'clock P. M., and will continue through the week. The general sessions will be held in the College Chapel; the section meetings in lecture rooms of the cabinet buildings.

Diamonds.

The Washington Globe is incorrigible in the matter of artificial diamonds. It is quite skeptical about inventions, and sticks to the opinion of old Solomon, "there is nothing new under the sun," with an orthodox tenacity that is perfectly refreshing during this hot weather. Well, we like the man *wot* has *an opinion* of his own.

Thunder Storms.

When overtaken out of doors, by a thunder storm, never resort to a tree for shelter; better take a wet skin and a safe retreat to the open field. Do not have any metal, nor metalic implements about you while exposed to electricity. We saw an account of a youth who was killed while whittling a stick beneath a tree while his companion at his side escaped uninjured. The lightning always seeks the nearest road to the best conductor. A bright pitchfork, spade, or manure fork carried tine upwards is certain to attract electricity during a thunder storm.

Soda and Chloride of Lime.

A party of Germans have erected in Steubenville, Ohio, an establishment for the manufacture of Soda Ash and Chloride of Lime. It is the only one of the kind in the United States; it is estimated that during the first year it will produce between $40,000 and $50,000 worth of Soda Ash, and nearly $20,000 in value of Chloride of Lime. It is supposed that the amount of manufacture will be doubled the second year.

Consumption of Gas in England.

In Great Britain and Ireland there are 730 public gas establishments, beside 45 private ones. More than fifty millions of dollars are invested ; nine thousand millions of cubic feet of gas is consumed, and 1,125,000 tons of coal are required to produce this vast amount.

East Tennessee Mining and Manufacturing Company.

A company is organized to build up a manufacturing town near where the Nashville and Chattanooga Railroad will cross the Tennessee River. A factory of 10,000 spindles, the machinery to be driven by steampower, is about to be erected. Two coal mines are opened there, and fuel, therefore, will be cheap.

Honor to an American Historian.

The University of Oxford, as we learn from the British papers, has conferred the honorary degree of Docter in Civil Law on Mr. Prescott, the well know American historian.

The Citizens of Charleston, S. C., are discussing the feasibility of introducing into the city a supply of water from the Edisto river, fifty miles distant. The estimated cost of the work will be only half a million of dollars.

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For the Scientific American.

Review of the Rise, Progress, and Present Importance of Cotton Manufactures of the U. S., together with Statistics, showing the Comparative and Relative remuneration of English and American Operatives.

BY THOMAS H. DODGE.

[Concluded from page 363.]

How different is the condition of the American operative: commencing upon pay, as learners, which enables them to enjoy all the necessary comforts of life, they are seen at church, in the Sabbath school, and at the social gathering, side by side with their employer, who seem to take as much interest in ther physical, mental, and moral welfare, as if they were bound together by ties of blood and consanguinity. And thus it will be seen that the American operative and mechanic enjoys all the pleasures and blessings of social life, while their labor, owing to the kind and benevolent policy of the American capatalist, to assist them in the successful prosecution of their various employments and in surrounding the place of their labor with all that is pleasant and agreeable; partakes more of mental feast, and an intellectual treat, than it does of the severity of physical toil and labor. And well may America be proud of her leading spirits in manufactures. And she will not be ungrateful to them when dead, for she will hand down their names and memory to latest posterity. To the table below I invite especial attention; it is based upon the most careful inquiry and information.

A TABLE showing the annual and aggregate amount of wages which the Operatives employed by the principal cotton manufacturing establishments in the United States, would received at English prices, together with the annual amount which they have received over and above what they would in England, from 1838 to 1848, inclusive.

Years.	Wages of Males.	Wages of Females	Aggregate.	Annual sum paid to Am. op. over and above Eng. prices.
1838	1,310,400	3,177,200	4,487,600	9,167,600
1839	1,4'4,000	3,380,000	4,784,000	9,776,000
1840	1.450,800	3,515,200	4,966,000	10,145,200
1841	1,291,680	3,109,600	4,401,280	8,993,920
1842	1,544,400	3,718,000	5,262,400	10,753,600
1843	1,591,200	3,988,400	5,579,600	11,382,800
1844	1,872,000	4,461,600	6,333,600	12,948,000
1845	2,059,200	4,867,200	6,926,400	14,164,800
1846	2,152,800	5,070,000	7,222,800	14,773,200
1847	2,340,000	5,746,000	8,086,000	16,510,000
1848	2,527,200	6,422,000	8,949,200	18,246,800

Average amount to each operative over and above what they would have received at English prices, is $150,26 per annum.

Total amount that the male operative of America would have received at English prices, for 11 years, $19,543,680.

Total amount that the female operative would have received, $47,455,200.

Total aggregate at English prices for 11 years, $66,998,880.

Aggregate amount paid to American operatives over and above English prices, during 11 years,—$136,861,920.

Does not the enormous sum of $135,861,120 which has been paid to laborers employed in the Cotton Mills of this country, over and above what they would have received at English prices during the period above named, and which amounts to $150,26 as the average to each operative per annum, over what they would have received in cotton Mills of England, go far to convince all that the productions of America must be protected by the government, or else they must cease, unless the American mechanic and operative's wages are reduced to the sickening level of the English laborer. It is said that the capital vested gets all the profits. Therefore let us examine into the subject that we may know the truth, for it is the truth we seek. There is invested capital in the manufacture of the various cotton fabrics, of $1000,000,000

Employ male operatives to the number of	27,000
At aggregate prices per annum,	$8,424,000
Employ female operatives to the number of	95,000
At an aggregate per annum of	$18,772,000
Pay taxes to the amount of	$720,000
Use leather, pounds per annum	400,000
Use in the various processes, lbs. of starch per annum,	13,800,000
Barrels of flour per annum,	23,000
Tons of coal per annum,	360,000
Bushels of charcoal per annum,	350,000
Cords of wood per annum,	90,000
Gallons of oil per annum,	830,000

To which may be added large quantities of lard, tar, tupentine, tallow, paints of various kinds, lumber, &c.

Now every one must admit the above enormous expenditures per annum, go in the main to reward American labor. To whom the enormous sum paid per annum for cotton goes, the wealthy planter at the South can answer. Now is it more than just that we should inquire into the actual profits which do accrue to capital as invested as above. And will not all admit that the capital thus actively engaged in diffusing abroad through all classes of society, and especially the laboring class so bountifully the means by which to obtain all the necessaries and comforts of life in wide profusion, ought in justice to be permitted to reap a profitable return—one commensurate to the blessings bestowed. And yet, notwithstanding the bold assertion of some unacquainted with the subject, when by careful inquiry and attention, the profits of the above $100,000,000 for the period above named, are gathered and added together, they do not amount to but about 5 per cent. upon an average. Six per cent., says one, for a series of 11 years, per annum is enough. But stop; there is one very important item to be considered, one which is generally left out of the account, and one to which I would most respectfully invite the careful attention of the legislators and the American press. Admitting that companies have divided 6 per cent. per annum—call it 7—and yet by the most careful and economical management they have not been able to divide even 7 or 6 per cent. per annum from the actual net earnings of the mills, without making large drafts upon their capital in one way or another. And it is a fact that cannot be denied, that the mills, machinery engines, and other apparatus belonging to the cotton manufacturing companies of America, have depreciated during the last 11 or 12 years, by reason of exposure and wear and tear, above the ordinary repairs, so much so that 25 per cent. on their capital, or $25,000,000 would not more than make the original investment good, and enable it to compete succesfully with new capital invested now, other things being equal. And it is safe to say, that those who are loudest in their cry against manufacturers would not take their machinery upon an average at 50 per cent. discount and I don't think many of them at 60, or even at 70 per cent.? Now is it not plain, that this $25,000,000 should be deducted from the dividends declared in order to get at the actual net profits of the capital. Most certainly, all will admit, if the companies have not laid by a contingent fund to meet this exigency. But instead of laying by anything, the companies have, taking them together, made actual drafts upon the credit of their capital to meet their running expenses. After deducting the above 25 per cent. there is left for actual profits to capital, about 4 per cent per annum. Now considering the very great liability to losses by fire, breakage, and a thousand other risks that might be named, does any one believe the investment at 3½ or 4 per cent., much better than money loaned at 6 per cent. The companies have been living in hopes of better times so long, that they have well nigh come to the brink of bankruptcy—and unless government extends a helping hand soon, there must be a general crash in the business, or else the operatives' wages must go down to the starvation prices of England. For how can they compare it with English manufactures when the English have the advantage of $18,246,800 in the item of labor, with machines and other things in proportion. Some as a last resort will say, that the supply is greater than the demand, that there is too much machinery in the world, and that government ought to withhold its aid, and let Americans stop their mills until the supply is exhausted. What! shall America! O shall free republican America ever stoop to the humiliating aspect of entering the workshops and factories where labor her industrious mechanics, artizans, and operatives, and by the potent power and influence of her laws, bid them to cease to ply the shuttle and wield the hammer—subjecting them to remain idle or to seek in vain and fruitless endeavors for employment elsewhere, for the sake of gratifying the overgrown and distorted system of servitude in the old world, and give it a fresh opportunity to clutch its victims of oppression with a firmer grasp—the more effectually to bind them to the rack of starvation and to force them closely in the prison houses of prostitution and infamy?—God forbid that history shall ever record such a suicidal act on the land of immortal Washington and his illustrious cotemporaries.

Finally, Messrs. Editors, if I have communicated anything that shall enable any one to view the subject of cotton manufactures in a clearer light, or that shall even prompt to a spirit of honest inquiry, I shall have the satisfaction of knowing that the labors, researches and patient investigation of years have met with the reward at least of not having been utterly in vain.

[The Scientific American is the advocate of Industry, but the discussion of antagonistic political questions, like that of a Tariff, belongs to party papers, or the Merchants' Magazine. We have indulged Mr. Dodge in his article, for the purpose of bringing out his statistics of comparison. The question of Protection is one which some say should be applied to manufactures, or products only, and there is another class which say it should be applied to individuals also. The one would prohibit foreign manufactures, the other would prevent foreign emigration. These opinions are not to be discussed in our columns—every man to his trade. We think Mr. Dodge is not correctly informed in respect to the payment of English operatives, and we dissent entirely from his opinion respecting their moral character. Is it a natural consequence that poverty and licentiousness should go hand in hand? No. It is a common opinion in New York that our eastern manufacturing districts, are prolific in furnishing very bad characters for our cities. We never could see how this was a consequence of manufacturing, but we state the common opinion. Mr. Dodge states that the American operative is better clothed, educated, &c., than the middle classes of Europe. If he means the middling classes of manufacturing England, he is mistaken on the subject. The middling classes are the farmers, lawyers, authors, merchants, manufacturers, small landholders, industrious tradesmen, and artists. Fifteen years ago we travelled through that country, and again in 1839: great changes have no doubt taken place since then, but in respect to education, we must say "the middling classes of Britain are very highly educated." The factory operatives in Britain have good advantages in education—for the manufacturer is bound by law to allow his operatives, under a certain age, certain hours every day for education, which is furnished free. There is one thing not very favorable to the progress of British manufactures, that is, the decreasing wages of the operatives. Fifty years ago, they made higher wages than ever were paid to our operatives.

The Electric Light.—Mr. Paine's Discovery Corroborated by Experiment.

MESSRS. EDITORS—I have passed hydrogen through turpentine and found it to acquire high illuminating properties. You know there is an old experiment of the "philosophical candle," made by generating hydrogen under a stratum of turpentine; but thinking the newly generated or nascent hydrogen might have the power of decomposing or absorbing the turpentine, I led the hydrogen from the generating bottle by a bent tube dipping under the turpentine in a separate bottle. The light was very brilliant; inintensity, I thought, between the Drummond light and the solar lamp; a spirit gas light looked dingy alongside of it—as ordinary lights appear by the lime light. The taking of a daguerreotype by it would have been very easy.

I next directed my attention to ascertain the quantity of turpentine used along with a known quantity of hydrogen. I first accurately measured a portion of turpentine, and then passed the gas from 33 ounces of zinc through it, burning the gas at the jet all the time. I then again measured the turpentine, and found it not perceptibly less than before. Now, in this case the hydrogen could not have been changed into carburetted hydrogen, for coal gas contains from four to five times as much carbon as hydrogen, and pure carburetted hydrogen has 6 times as much carbon as hydrogen; and as 33 ounces of zinc, by solution, liberate 1 ounce or 12 cubic feet of hydrogen, therefore from 4 to 6 ounces of turpentine should have been used up, supposing it to be all carbon, but turpentine is composed of 20 atoms of carbon to 15 atoms of hydrogen and consequently only one-seventh of its carbon can be taken up by the hydrogen; or in other words, 42 ounces of turpentine will be required to carburet one ounce of hydrogen. Yet still thinking that some portion of the turpentine might be evaporated, I cooled the bottle with the turpentine, and placed the whole apparatus in a cold bath, and tried the experiment over again, but the light was the same. I then heated the turpentine to 120 degrees, and then passed the hydrogen through it, but the light was the same. I then took a half gallon tincture bottle, and put in nearly three pints of cold water and three-quarters of a pint of turpentine, and let the pipe from the hydrogen generator run quite to the bottom of the water—the light appearing the same, or a little better. I have used the same lot of turpentine in all these experiments, having had a brilliant light for about three hours; and the turpentine, though frequently poured from one bottle to another, is not a teaspoonfull less than before I began the first experiment.

I have now announced to you the simple facts of the matter, the rationale I leave to the scientific world. The next step, after ascertaining that hydrogen can be used for illumination, is, whether the light is according to its weight or its bulk, as compared with coal gas—that is, within 200 cubic feet of this catalyzed hydrogen will go as far for light as 200 feet of coal gas, or whether it will require 200 feet—1 pound of the hydrogen to do the work of 26 feet—1 pound of coal gas. Very truly yours, &c. GEORGE MATHIOT.

Washington, July 27th, 1850.

[All the certificates and letters published by Mr. Paine's friends have no value at all in comparison with this of Mr. Mathiot. Now, Mr. Paine, let us have the whole discovery, and lay it open to the public, and illumine all cavilers on the subject. You can maintain your claim to gas produced by passing it through turpentine.

Mr. Mathiot is Electro Metalurgist attached to the U. S Coast Survey; he possesses a vast amount of practical scientific knowledge. The light was seen by the scientific gentlemen attached to the survey.

Water and Coal Gas.

In the month of August, 1846, M. Jobard published in the *Bulletin du Musee Industrie*, the result of some of his experiments on gases for illumination, wherein he states that he caused hydrogen, made from water, to take up hydro-carburets produced by the distillation of coal gas at the moment of formation, and that thrice the quantity could thus be obtained of illuminating gases, than by the ordinary methods. In experiments made with more than 1,500 feet of gas, watched for several hours, it was found that 111 feet of gas were produced from every pound of oil.

Blackberries.

The Hightstown (N. J.) Village Record states that thousands of boxes of blackberries and whortleberries are daily shipped from that place to New York, being purchased by speculators at a fair price. With regard to the crops it says:—The wheat, rye and hay crops, in this section, have been gathered, and it is said that such an abundant harvest has not been known for many years. The wheat was entirely, or nearly so, free from the rust and fly; a fact that is rather unusual.

The sum derived from the foreigner's tax in California, if it could be collected, would be enormous. The number of foreigners in the territory is estimated at 10,000, and $20 per month each would give an aggregate of nearly $2,500,000 per annum. The tax collector's commission is three dollars on each license, yielding a monthly income of $30,000, or $360,000 a year.

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New Inventions.

Devlin's Lubricating Liquid.

The lubricating material for machinery, invented by Mr. Devlin, of Reading, Pa., and patented by him in this country, has recently been patented in England, where he was on a visit last year. It is patented in the name of a merchant in Manchester, and the composition has been published in foreign journals. It consists of four lbs. of india rubber dissolved in turpentine, 10 lbs. of soda, 1 lb. of glue, 10 gallons of oil and 10 gallons of water. The alkali is dissolved in the water, then the oil is added, all stirred well, and when fully incorporated together, the dissolved india rubber is added and well stirred; after this the whole may be stored away in bottles or dishes for use. The principal ingredient in this is the india rubber, which enables the mixture to wear a long time, and affords a finer anti-friction material. There was an anti-friction grease manufactured in this city last year, from resin oil coagulated with fine dry burned lime. It was introduced into this city by an Irishman from Belfast, and was very cheap for heavy machinery. We have not heard of it for some time.

Employment of Gutta Percha in Medicine.

A late translation of a French paper states that M. Nytterhaven has been successful in preparing plasters from gutta percha for medical service. They are made by dissolving the substance in sulphuret of carbon, and are said by the French to be very serviceable in affections of the voice and of the liver, &c. We give the story for what it is worth. Will not the regular faculty on this side of the water try the experiments and give us the results.—N. Y Tribune.

[Plasters of dissolved gutta percha have been in use on this side of the water among the "regular faculty" for two years. The discovery is an American one and belongs to Cambridge, we believe. We had thought every body on this side of the water was aware of this fact. Chloroform is employed to dissolve the gutta percha—the solution is first rate for cuts. If a printer gets the points of his fingers cut, or the cuticle worn with new type, let him go to a druggist and get them pointed with this gutta percha liquid; no sooner is it applied to the fingers than they are covered with a thin white hard, yet flexible firmly adhering skin—the chloroform evaporates in an instant, and leaves the gutta percha behind. Gun cotton dissolved in chloroform makes a good plaster also, but not like gutta percha for the hands of a working man.

Improved Power Loom.

The Norwich (Eng.) Mercury states that Mr. Richard Shaw, son of a prominent manufacturer in Norwich, has succeeded in accomplishing an invention which gives the power to weave by hand two perfect pieces of goods, however varied in color, complicated in pattern, or fine in texture, by the same throw of the shuttle, and extremely little increase of labor beyond what is required in weaving a single piece. Several attempts have, we believe, been made to accomplish the same end, and the great difficulty experienced has been to obtain the selvages of the separate pieces.

[This is a very singular paragraph; except in the weaving of what are termed tapestry carpets, (the pattern printed on the warp) where the weft is all one color, we cannot conceive how one shuttle can weave two webs of different patterns. If the above means that one throw can operate two shuttles to weave two webs, then it is plain, but the invention is not new. Five different webs can be woven with one throw, all the shuttles moving at once. Coach lace, tape, lamp-wick, &c., are woven in this manner. Whatever people may say to the contrary, it requires just about double the power to weave two webs as it does to weave one.

Southern Shoes.

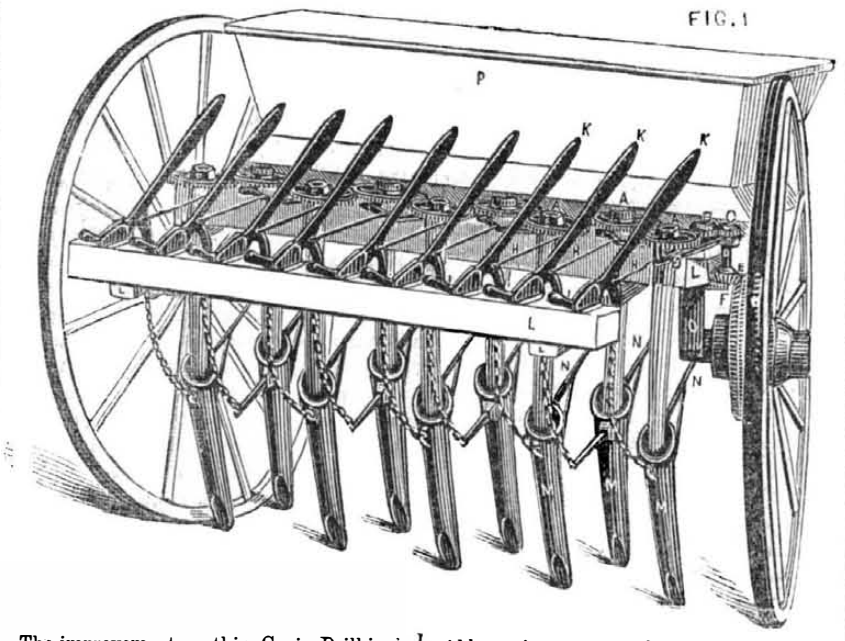
Several small factories for making boots and shoes have been established in Georgia and South Carolina.

Improved Augur.

Mr. J. E. Larkin, of Ballston Spa, Saratoga County, N. Y., has made a good improvement in the way of fastening the stock of the augur, for which he has taken measures to secure a patent. It consists in securing the stock of the augur in the handle, by having a hole drilled through and a thread cut on the end of the shank, which passes into the socket in the handle; and the handle is made in two halves or sections, the one with a spindle in it, the said spindle having two screws cut on it and the whole fitting into the other section of the handle, to form a metal ferule round it—the spindle passing through and screwing into a thread, like a nut, at the other end of the handle, and into the thread of the hole in the shank likewise, whereby the augur is screwed up perfectly immoveable, (a necessary requisite), and it can be taken out at any moment, like the tool out of a bit-stock. We will publish an engraving of it in a few weeks.

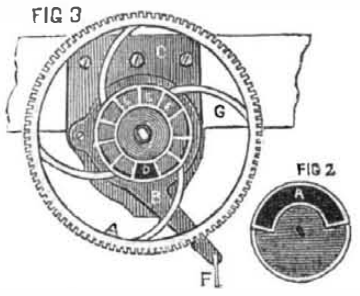
IDE'S IMPROVED GRAIN DRILL.

FIG. 1



The improvement on this Grain Drill is in the method of distributing the grain, and in respect to its operative qualities (the first thing to which attention should be directed,) we would state that a number have been constructed, and all of them, we are informed, have worked to perfection. The inventor is Mr. Samuel Ide, of Millville, Orleans Co., N. Y., who has taken measures to secure a patent for his improvement. Fig. 1 is a perspective view, with one of the wheels thrown out of line. Figures 3 and 4 are plan views. The same letters refer to like parts.

FIG 3



L L L L is the frame; P is the grain box, raised to show the distributors; O is a cranked shaped cast arm, bolted to the centre cross-beam of the frame; A A A are the seed wheels or distributors, which turn on plates bolted to said beam in a zig-zag form, to distribute in two rows; F E is bevel gearing; F is bolted to the carrying wheel, E attached to the shaft, D, at the upper end of which shaft is attached the wheel, C, which may be taken off, and a wheel larger or smaller put on, to vary the quantity of grain to be sown to the acre. B is a movable wheel to connect the wheel, C, with the seed wheels. A lever is attached to the wheel, B, to put it in or out of gear with the wheel C. M M M are the hollow teeth; N N N is the beams attached to the shanks of the teeth, and hinged to the frame. The chains are attached to the teeth and to the levers, K K K. The rods, H H H, connect the levers and movable plates, B, fig. 3, in raising the teeth by the levres, the grain is shut off. I I are handles to the catches to hold the levers when the teeth are raised. A, fig. 3, is a seed wheel; G is the cross beam to which the plate C is bolted; B is the movable plate, when it is drawn out or swung around by the rod at F, the hole, D, is carried outside of the spaces, E E E, in the seed wheel, and stops that wheel from distributing. A, fig. 2, is the hole through which the grain passes from the box into the seed wheels at E E E, fig. 3, and is carried around to the hole, D, where it passes through the plates into the tubes.

Mending Cast Iron Vessels by Fusion.

The Washington Republic thus refers to a package lately brought home by Commodore Geisinger, for the Patent Office:

"Van Braam, and more recent travellers having often referred to without sufficiently describing, a method in universal use in China, of rendering cracked cast iron vessels perfectly sound by means of fused iron, the Commissioner took advantage of an offer made by the Hon. J. Balestier, U. S. Envoy to Eastern Asia, to furnish any information on the arts, &c., of the East. Mr. B. has sent by Com. G. a vessel repaired in his presence, with specimens of the materials and implements employed, an account of which will appear in the next report."

American Water Pipes.

It is stated in the latest intelligence received from the Sandwich Islands, that one hundred tons of water pipes, cement and other appliances for conducting pure water from the valley into the city of Honolulu, had been received by a recent arrival from Boston.

Good Plan for Fertilizing Land.

Sow three bushels of Indian corn broadcast, and when it is 18 inches above the ground plow it in. This is said to be a better plan than plowing in clover.

Improved Rice Cleaner.

Mr. Peter McKinlay, of Charleston, S. C., has made a good improvement on an apparatus for cleaning rice, for which he has taken measures to secure a patent. The rice is placed in conical chambers, and there is a rod and beetle passing into each, which receive an up and down motion to agitate and rub the grains of rice upon one another, to remove the fine hull completely. The grain, after being thus agitated for some time, is let out and winnowed from the hulls, when it appears beautiful and clean. The machinery is exceedingly simple.

Improved Railroad Sleepers and Chairs.

Mr. H. H. May, of Galesburg, Illinois, has invented a new plan for laying down and fastening rails, for which he has taken measures to secure a patent. He constructs the sleepers of cast metal, and they consist of a broad solid base, upright post, and cross-tie—each post having a cross-tie to be coupled in the middle of the track by its opposite neighbor. On the head of the post, is a recess or chair, to receive the rail and by turning it slightly out of line with its fellow, the rail is firmly secured without a spike or bolt.

Wooden Pavements are about to be abandoned in Boston, on account of accidents to horses.

To our Subscribers.

Friends, our next Volume will commence on the 21st of next month, and we merely call your attention to this at present, with the hope of shaking your hands on our new subscription term. With many of our subscribers we have long been on terms of more than subscribing friendship, and we trust it will be long before our friendship will be severed. The Scientific American has nearly completed its Fifth Volume, and we need not say how we have been enabled by the kindness of subscribers and the friends of useful information, to carry it to the highest niche of American weekly Scientific periodicals. It is quoted as authority, in matters of science and art, by the first Journals at home and abroad. With science we have endeavoured to combine the truly practical, conveying our ideas in simple, but clear language. Our long acquaintance with mechanical and manufacturing operations enables us to speak of things, as they are, and comment upon them as they shoud be. The deep theoretical views of book authors, we endeavor to render useful by making them practical. We hope every friend of progress in the Arts and Sciences, and those favorable to the dissemination of useful knowledge, will help to extend our circulation over a still wider field during our next volume. Will every subscriber endeavor to get a neighbor to subscribe for our next Volume? For clubs, our terms are indeed favorable, and even to single subscribers, our Volume forms a very cheap book.

Carbon, or Coal.

Carbon exists in nature, in various forms, and is the principle source of artificial light and heat. It is found crystalized in the diamond, and graphite, and in the less pure anthracite and other coals. The combinations of carbon and oxygen are various; some anthracite coal contains 95 per cent. of carbon; black lead contains from 88 to 95 per cent., and is sold in London at ten dollars per pound. There is good black lead in Pennsylvania. Coke is the residue of bituminous coal burned in ovens, or retorts in gas works. It is nearly pure carbon and gives a great deal of heat; it is used on all the locomotives in Britain, and would be far better than wood with us, if it could be used at as little expense. Hard coke has a metallic appearance, and we believe the base of it to be a metal. It is an excellent conductor of electricity, and serves instead of platinum for a galvanic arrangement. Zinc and coke plates make a good galvanic battery.

Carbonic oxide and carbonic acid, are formed by the union of carbon and oxygen. Carbonic oxyde is expressed thus, (CO); carbonic acid, (CO^2). Carbonic oxide is produced in furnaces where there in not a sufficient supply of air; this is the cause of a great loss of heat, for the heat is always in proportion to the quantity of oxygen consumed. It is carbonic oxyde which is often seen burning at the tops of some chimneys with a blue flame—this is a sign that there is a loss of heat in the furnace, the only remedy is to allow a small supply of air to enter the furnace, which may be regulated by a valve for that purpose, to allow the air to pass over the hottest part of the fire into the back of it, to mix with the carbonic oxyde and form carbonic acid, which gives out twice as much heat. A great deal of heat is lost in some furnaces for a lack of this knowledge.

Wooden Cornices on Houses.

It is quite a common style of architecture among us to ornament the eves and cornices of our buildings with wooden carvings of gingerbread texture. This style of ornament, on otherwise decent brick and stone houses, must be very ancient, seeing it is so much prized. At any rate it must have existed long anterior to the reign of Beauty in Greece, or that of Grace in Rome.

Notice.

Next week we shall publish Hubbell's Solar Magnetic Engine. We have the engravings all on hand, and to a great many of our readers, this will be a curious and interesting subject.

In our list of Patent Claims for this week, four of the number granted were applied for through the "Scientific American" Patent Agency.

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Scientific American

NEW YORK, AUGUST 10, 1850.

The Progress of Invention.

From the great number of patents issued every week, and the vast number of inventions in the shape of discoveries and improvements, which are continually pouring forth upon the world, many, otherwise very sensible people, have become quite skeptical on the subject—perfect unbelievers in the *progress of invention.* To them *invention* and *humbug* are synonimous terms, and the whole congeries of patents are just so many gilded cards to gull the public. This class are not generally composed of ignorant men, in the common acceptance of that term, (although many of them are), nor are they unskilled, but they appear to have a rooted disposition to jeer at all inventions, especially those in their own line of business, at least if the improvements are made by those out of such a business. There are many mitigating circumstances to pardon this skepticism. Every week brings out some *new* invention, which proves to be nothing more than some old abandoned one. The great fault with a number of men who have very ingenious minds, is, the want of extensive information—they are practical and constructive, have dispositions of *making* at once with their hands that which they have designed in their heads. Reading and study require greater powers of determination than severe physical labor, but all those who do labor in this field are amply repaid for it afterwards. There are a great number of useless things patented, some of which gain no small degree of favor for a time, while many good ones are neglected and despised by those who should know better about such things; and it often takes years of patient working before their merits are fully acknowledged. This was the case with steam navigation, submerged water wheels, and many other inventions which we might mention. The *progress of invention* is gradual, and blessed be God! who gave man *the faculty*, it is sure; and of late years the inventions and discoveries in science and art, exhibit a series of the most splendid triumphs of mind over matter, respecting which "the most immoderate flight that ever poet took when warm with wine, was moderate conjecturing." The men of forty-five years of age, now living in our city, have seen the first successful steamboat which navigated our waters, and the young man of twenty-one, he who has just arrived at the age of manly responsibility, is a cotemporary of the first locomotive. What revolutions these two inventions have produced—steam navigation and railway locomotion—and what a gorgeous panorama passes before our vision as we trace the progress of other inventions. The subject is one which requires the long labor of some scientific philosophic historian to do it justice. In 1809 there was only one steamboat in the whole world, now, who could count their number? They navigate the Nile, the Red Sea, the Ganges, the Danube, the Rhine, the Thames, the Clyde, the Hudson, the Ohio, the St. Lawrence, the Mississippi, and the golden sanded Sacramento. America, Europe, Asia and Africa exhibit in every steamboat a monument to the progress of invention.

In 1830 there were only thirty miles of locomotive railway in the world, now there are no less than 18,000 miles. America has no less than 7,000 miles, and will soon have 10,000 in operation. Massachusetts alone has more than 1,000, and Pennsylvania 1,200. In 1836 there were only 15 miles of railroad in the State of New York, now there are nearly 1600. Then the slow canal boat and stage coach wound lazily up the Mohawk Valley, and we remember well how it required more time to whip an old *bolter* into a canter, than it now requires the iron horse to whistle itself from the crags of Cohoes to the rocky pass of the Little Falls. What, with the Steamboat, the Railroad and the Telegraph, as inventions for *distancing distance*, the ends of the earth are brought together, and civilization is now fast finding its way into the most darkened corners of the earth.

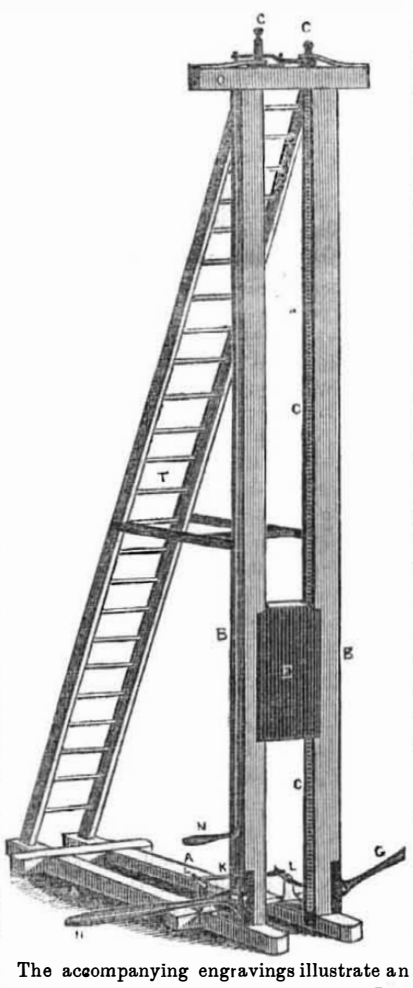
The *progress of invention* is one of those grand means, in a general scheme, which the most unobserving cannot fail to notice, of bringing about the fulfilment of that remarkable prophecy of Burns, "when man to man, the world around, shall brothers be." There were men who looked upon Fitch and Fulton as mad, and some of the Members of Parliament thought Stephenson a demented foreigner; and when the first line of telegraph was erected in our country, we heard a wealthy and well educated merchant pronounce it "a humbug!" We feel the necessity of frequently calling attention to inventions in the aggregate; for in some arts, the progress is slow, almost infinite in additatives, to bring them to perfection, but not the less sure in progress for all that, though unheeded and unobserved by the majority.

Inventors have much to do yet, and some grand discovery has yet to be made to economise fuel in propulsion; for the expense in that particular, especially for ocean navigation, is yet a great barrier to general intercommunication between distant nations. And shall it it ever be, that we shall see the atmosphere as safely navigated as we now see the ocean? The day may not be far distant; inventors, when your courage flags, look back and feel your strength renewed by surveying THE PROGRESS OF INVENTION.

"Come, bright Improvement! on the car of Time,
And rule the spacious world, from clime to clime;
Thy handmaid arts shall every wild explore,
Trace every wave, and culture every shore."

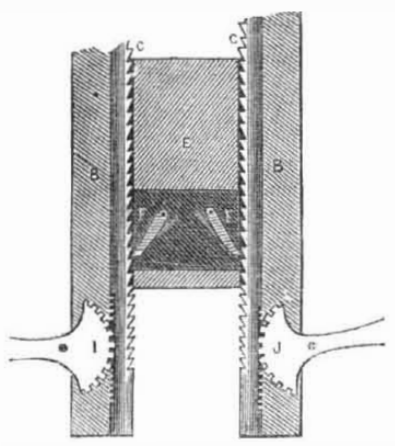
Improved Pile Driver.

FIG. 1.



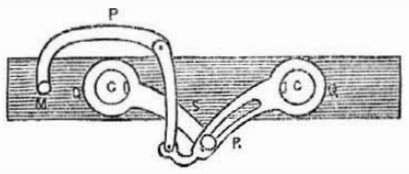
The accompanying engravings illustrate an improvement in the operative parts of Pile Drivers, invented by Mr. William T. Foster, of Jersey City, one of the inventors of the Rock Drilling Machine, illustrated and described in No. 20, Vol. 3, Sci. Am. Figure 1 is a perspective view; figure 2 is a vertical section, and figure 3 is an enlarged top view, to show the shifters, which allow the ram, or weight to be raised and fall down on the pile. The common pile driver has the outline of its frame constructed like figure 1, but the ram or weight is raised by a rope wound round a barrel, and when the weight is raised to the top of the frame, a pair of prongs throw the nippers on the rope out of catch with a staple on the weight, and the weight then suddenly falls. This improvement is to raise the weight with rack and pall, by working the weight with reciprocating ratchet levers, whereby two men can work the ram with the greatest ease—allowing them a little more time than four men with a windlass. A A is the bed framing; B B are the upright posts forming the cheeks of the machine, C C are metal rack rods on the inside of the posts, B. E is the ram or weight for driving the pile. It is raised to the top of the posts, B B, and then allowed to fall freely by its own gravity on the head of the pile. This is the way the pile is driven down. The

FIG. 2.



improvement consists in the manner of elevating the weight, and the way of setting it free, consequently, is different from other plans.—The principal part is having the racks cut on round shafts or rods,—C C, in figure 1 representing the tops of them. This is to allow the shafts to be turned round, and also be moved freely up and down in their recesses in the posts, B B. G H are levers with arc racks, I J. (fig. 2) cut on their interior ends. These levers are connected together by a walking-beam arm, K, connected to the axis, L L, of the levers; therefore, when one lever is moved up the other moves down. The racks of the levers mesh into short racks on the back of the ratchet rods, C C. When the levers are worked, the rack rods, C C, are moved up and down alternately, and by having two spring palls, F F (fig. 2) on the inside of the weight, it will easily be perceived how the said weight is raised by the rods, C C, being alternately raised up and down. The weight cannot come down while the palls, F F, mesh into the racks. Whenever the weight gets to the cross head of the posts, the racks are turned round, inside, in their recesses in the posts, and the weight then comes thundering down on the pile. To turn the rack rods, there is a long handle, N, fig. 1, which, by drawing it to the one side, turns the rack rods out of gear, or into gear with the palls on the weight. Fig. 3 shows the levers attached to the handle, N, and the rack rods. S R are the two levers, with rings, Q Q, around the rods, C C. They are connected by a link to the oscillating arm, P, which is secured at M to the handle, N. One of the levers has a slot in it, and the other has a stud pin, which works in the slot, therefore, when the handle, N, is pushed to the one side, the rack rods are turned and disengaged from the weight, when the weight reaches the top. When the weight has performed its work, the rack rods are turned by the handle to engage the palls, F F, to elevate the weight again by working the levers. Except for shifting the machine, one man can elevate the weight, as the motion of the rack rods is arbitrary—alternately up and down every stroke. T is a ladder, also answering the purpose of a brace.

FIG. 3.



Application has been made for a patent for this invention, and it has already been sold. Peter Kiyler, 333 Ninth st., this city, is the assignee, who will answer communications (*p.p.*) which may be addressed to him.

To Make Tracing Paper.

Mix six parts by weight of the spirits of turpentine, one of rosin and one of boiled nut oil, and lay this on the paper with a brush or sponge. If the balsam of copavia, or Canada balsam is employed as a substitute for the rosin, a finer quality of tracing paper is the result. The paper should be well dried before it is used.

To Our Cotemporaries.

A copy of the present number of the Scientific American is forwarded to every newspaper publisher in the United States, for their perusal, antecedent to the commencement of Volume 6. Our cotemporaries have hitherto spoken in high and courteous terms of our efforts, and we shall rejoice to know that we have not forfeited their kind wishes for the future.

The field occupied by us, is one that in no way interferes with any other publication in the country—and while aiming to extend the benefits of mechanical ingenuity—we feel encouraged to still further exertions from the continued smiles of the community and our brethren of the press. We have never pursued an indiscriminate system of exchange, it being impossible for us to do so without experiencing a heavy draft upon our pecuniary condition. This is readily perceived from the fact that in the peculiar field to which our efforts are mainly directed, we are continually culling from the great book of nature the mysteries of science and philosophy—thus rendering the Scientific American a valuable acquisition to every publisher's exchange list. We can only say, that to those who choose to insert the prospectus found in an extra enclosed in the number sent, they will be entitled to the "Sci. Am." through the volume without an exchange.

We find by actual count, that 563 papers published our prospectus to Volume 5.

We shall esteem it a favor to be informed of any omission on our part in sending the paper, and we request all publishers, who insert the prospectus, to send a copy, marked, to this office.

Water Wheels.

We have received a communication from Mr. George Westinghouse, of Central Bridge, N. Y., stating that Mr. Levi Totten, an old millwright, had told him that he put up four wheels on a horizontal shaft, for a saw mill, on the Oswego river, in 1829, and that several reaction water wheels, on one shaft, had been put up on the Oneida river in the years 1825 and 1826.

We have received a great number of communications within the past five months, about Parker's Water Wheel, some in favor and some against his claims—but by far the greatest number against them. It is not our purpose to allow much controversy on any one subject—for it generally becomes an old story, of no profit to any body. When short, crisp and racy, it does good, but not otherwise. The principal complaint has been against Parker's agents for collecting rent on wheels they did not construct or put up. Well, it is aggravating to any man who has paid a millwright for a water wheel, in the full faith of its free use, to be called upon to pay rent or stop the mill. If Parker is not the first inventor of what he claims, the thing is to prove it at law, and then his claims are made void. On the other hand, if he is the first inventor (and many suits have been decided in his favor) surely in the eye of the law his claims should be upheld.

"Brains."

A worthy cotemporary has worked himself up into fermenting heat, because we alluded to some of his ginger-pop extracts, giving him credit for the full value of them under the cognomen of "Brains." He thinks we are in dudgeon about them, but we assure him that we are not; on the contrary we are cool and calm as a whale brushing away a *blue bottle.* In allusion to our article last week our cotemporary says, "as we have no *mulish* propensities, will the editor be so good as to keep his offspring from breaking over into our premises, to the great annoyance of the quiet and unobtrusive "*Farmer.*" The editor can only answer, "I am Saul, the son of Kish, sent out to seek my father's long-eared 'hanimals,' and having wandered into the quiet premises of the Farmer, lo! I found one of them."

The Gillard Light.

We have received some very interesting information from a Manchester (Eng.) correspondent about the actual operation of this light which we will publish next week.

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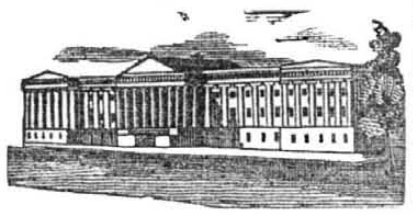

☞ Our weekly List of Patents and Designs contains every new Patent, Re-issue and Design emanating from the Department, and is prepared officially, expressly for the Scientific American, and for no other paper in the city, consequently other journals are obliged to wait the issue of the "Sci. Am." in order to profit by the expense to which we are subject, and of course must be one week behind. Those publishers who copy from this department in our columns, will, in justice to us, give proper credit for the same.

LIST OF PATENT CLAIMS

ISSUED FROM THE UNITED STATES PATENT OFFICE,

For the week ending July 30, 1850.

To M. B. Ashley, of Watertown, N.Y., for improvement in directing water upon water wheels.

I claim the adjustible, vertical, water mouths or openings, arranged in combination with the outer or longest edge of the buckets, as described, whereby the greatest effect is obtained.

To A. Everett, of Middlefield, Mass , for improvement in machinery for turning out wooden bowls.

I claim the combination of the movable frames, with the reciprocating frame carrying the curved cutter arm, connected and operating as described; also the combination of the curved cutter arms, with the reciprocating frame, for the purpose described, and also the cutters, the spurs, the guards, constructed as described, and connected and fastened to the curved cutter arms, in the manner and for the purpose substantially as herein described.

To G. W. Hatch, of Parkman, Ohio, for improvement in stanchions for cattle.

I claim the arranging of the stanchions in a vibrating frame to accommodate the position of the animal when lying down.

I also claim the stanchion, or fall piece, in connection with the stay cords, by which means it is brought to an upright position when closing the stanchion, thereby preventing an animal taking the place which is occupied by the stanchion, when open.

I further claim the catch and spring, to hold the stanchion in an upright position in combination wrth the rope, for releasing the cattle from confinement, as herein specified.

To E. Kershaw, of Boston, Mass., for improvement in the attachment of pinion locks.

I claim the combination of the stud, and its recess or hole, or their equivalents with the side of the cell door opening, and the double hinged arm, and lock, substantially in the manner and for the purpose of preventing strain on the lock by pressure against the cell door by a prisoner or person within the cell, as above specified.

To P. Kirkham, of Waterbury, Conn., for improvement in attaching hooks and eyes to paper cards.

I claim the indenting or impressing the cards or sheets of paper in such a manner as to retain the hooks and eyes in their proper places upon the card until they can be fastened; in whatever manner they may be finally secured.

I claim nothing in regard to machinery for forming the indentations nor for the string, or whatever may be used in fastening, nor for the manner of applying it by gum or paste.

To J. Marsh, of Petersburg, Ill., for improvement in Churn-dashers.

I claim the double concave, perforated, discoid churn dasher as herein described and represented, and for the purpose set forth.

To C. J. Meinicke, of New York, N. Y., for improvement in distilling spirits of turpentine.

I claim the process as deseribed for distilling turpentine so that the spirits of turpentine are distilled and the rosin saponified ready for soap making at one operation.

To G. B. Milner, of Houston, Texas, for improved valve gear for steam engines.

I claim the combination of the fixed cam, with its frame and rods, and the adjustable cam, with its frame and rod, to which latter are attached the traversing and oscillating bar, having secured to one end of it a rod and at or near its centre another rod, which actuate respectively the eduction and induction valves, substantially in the manner herein described, forming together a simple valve motion and one which enables the engineer to regulate the degree of cut off at will.

[This invention was noticed by us about a year ago; it has been highly spoken of by all who have examined it.

To A. Olcott, of Millstone, N. J., for improvement in rubbing and polishing stone.

I claim attaching the stone, to be faced to a chain, one end of which is attached to a windlass, by which it may be lengthened or shortened; the stone being left free so as to be continually changing its position on the bed, during the operation of rubbing, by which an uniform and even wear is produced on the bed and a true face given to the stone in the manner substantially as described.

To J. O'Neil, of Xenia, Ohio, for improvement in Atmospheric Churns.

I claim the construction of the air tube, in combination with the plungers aud partition as set forth, whereby the cream is thoroughly agitated and intimately mixed with atmospheric air by forcing it alternately to the opposite sides of the partition, through branches of the air tube, as herein set forth.

To C. Perley, of New York, N. Y., for Jigger Windlass.

I claim first, the application of the double acting pawls, ratchet, disk, socket, and handspike, with or without the winch-head, whereby the power is applied to the horns, to rotate them in either direction as required, said application and arrangement being a combination of the double acting winch described in my patent of March 1848, heretofore referred to, whereby this combination of these two previously patented inventions effects new and useful purposes not contemplated and not attainable by either of the inventions separately, substantially as described and shown.

To E. P. Rider, of New York, N. Y. for improvements in apparatus for sizing and drying cotton batting.

I claim first, doubling or turning the ragged and uneven edges of the bat of cotton as it comes from the carding engine and pressing them down to join a smooth selvage, as set forth, by means of the curved plates, in combination, with the cylinders, (two) as described; or other equivalent means.

Second, I claim heating and ironing the surface of the bat of cotton previous to being glazed for the purpose set forth, whether performed by the means herein described, or other equivalent means.

I likewise claim, making the floating cylinder with check rings, or their equivalent, in the manner and for the purpose described.

I claim passing the bat through a space between the floating cylinder and compressive cylinder, and imparting the sizing to the bat of cotton without pressure, as described.

I claim making the drying chamber a double inclined plane, in combination with the chimney constructed as aforesaid for the purpose of increasing the circulation. I also claim the peculiar combination of the heating, selvaging, ironing, glazing, and drying apparatus; by which the bat of cotton, as it comes from the carding engine, is selvaged, ironed, glazed, and steam dried by a continuous process, as herein fully set forth, the sizing vat being placed directly beneath the compressive cylinder so that the sizing can be introduced fresh from the vat to the bat as it comes from the ironing cylinder, as described.

To J. A. Sabbaton, of Albany, N. Y., for improvement in purifying coal.

I claim the mixture with the lime of coke dust or "breeze," charcoal dust, or other carbonaceous substance, for the purpose of acting mechanically in the separation of the particles of lime and at the same time acting chemically in removing various impurities from the gas (which cannot be separated by the ordinary methods of purifying gas,) substantially as above set forth.

To E. S. Scripture, of Green Point, N. Y., for improvements in connecting hubs with axles.

I claim the application of the half boxes, with the semicircular lip, and rib, constructed to enter the grooves near the end of the axle box, said boxes being secured together and connected to the axle bar by any competent means and said ribs, grooves, and boxes operating as a substitute for a collar on the axle and to hold the axle box and wheel on the axle, and also to keep dust out of the parts, substantially as described and shewn.

To C. A. Spring & P. Boon, of Kensington, Pa., for improvement in the arrangement of pressure and feed rollers in Planing Machines.

We claim connecting the movable weighted pressure rollers with the stationary ones by oblique links, in combination with the additional rollers, the whole arranged substantially in the manner and for the purpose set forth.

To J. Stout & J. T. Stanton, of Waynesville, Ohio, for improvements in machines for forming tubes of sheet metal.

We claim supporting the forming roller, upon the short ends of the bent levers, (two) in combination with the upper roller, supported by springs, substantially in the manner and for the purposes herein described.

To W. F. Ward, of Portchester, N. Y., for improved bolt and rivet machine.

I claim first, gauging the length of the shank after a head has been formed on the end by pushing the head against a guage beyond the header, which has a lateral motion to allow it to pass by, substantially as described, in combination with the operation of cutting off the shank at such distance from the griping dies as by the same operation to determine or gauge the length of rod, or wire, which shall be left projecting beyond the griping dies for forming the next head substantially as described.

And lastly I claim cutting off the rod or wire, after the head has been formed, by the return lateral motion of the header, in combination with the rest, substantially as described, the edges of the rest and heading die being formed to answer the purpose of shears, as herein described.

To T. E, Warren, of Troy, N. Y., for improvement in car-seat backs.

I claim the forming of the backs of car seats of double curved plates of metal attached by the end to the arms of the seat, made to embrace both of the end pieces to which they are pivoted and on which the car seats are reversed, formed stayed and braced, substantially in the manner and for the purpose here specified.

To Jesse Whitehead, of Manchester, Va., for improvement in the counter-twist speeder.

I claim making the shaft with a serrated groove, in combination with the reduced portions of the shaft adjacent to said groove, wherein the roving runs from the twisting band to the bobbin in the manner and for the purpose herein fully set forth.

I also claim the combination of the spring, and pendent tapered arm, with the vibrating bobbin-arm, arranged and operated in the manner and for the purpose herein set forth, or in any other way which may be considered substantially the same and by which analogous results shall be produced, that is to say, any arrangement wherein a rubbing pressure is imparted to the arms, or their eqivalents, containing the journals of the bobbin for producing the effect herein stated, said arrangement preventing the sudden rebounding of the bobbin on the shaft when it becomes uneven from any cause which the mere spring and weight applied to the bobbin axle or its arms will not prevent, as I have fully tested by experiment; the spring when used alone being too elastic and the weight too dead, whereas the combination of the two causes the bobbin to rise and fall gradually, as herein fully set forth, obviates the evil.

To G. Wode, of Elizabethport, N. J., for improvement in fastenings for bureau drawers.

I claim first, the metallic strip or its equivalent constructed with the notch for receiving the fastening bolt as set forth.

Second, the locking bolt operated by the opening or closing of any one of the drawers for the purposes herein named the whole being constructed, substantially in the manner herein set forth.

New Flour—Quick Work.

The Rochester Democrat acknowledges the receipt of a half barrel of extra Genesee flour, made from wheat which the day previous was swaying gracefully upon the stalk as it stood in the field. It was made by Mr. L. P. Beers.

Patent Case.—Woodworth Planing Machine.

Nathan Mason vs. William Talman and others, before Justices Woodbury and Pitman, in the U. S. Circuit Court, R. I. District, July Term, 1850. The action was brought by the plaintiff to restrain the defendant from using the Woodworth Planing Machine in Providence, R. I.

The defendants were assignees of the exclusive use of the Woodworth Patent, issued Dec. 27th, 1828, re-issued July 8th, 1845, in certain parts of Rhode Island and Massachusetts, during the original term of the Patent and also for a nominal consideration of the same extent of right and territory during the term of extension granted by the Board of Commissioners under the 18th section of the Act of 1836, which term of extension expired December 27, 1849.

The plaintiff brought his action under an assignment, from the Administrator of the Patentee, for the exclusive use of the said Patent during the second or Congressional extension commencing on the 27th Dec., 1849, in a portion of the territory formerly owned by the defendants, and where they still continued the use of their original machines.

Judge Woodbury, delivered the opinion of the Court in favor of the plaintiff, and ordered an injunction to restrain the defendants according to the petition of the complainant.

For the want of space we are obliged to omit the charge of the Judge in the above case; but, as it is quite important just now to all concerned, we shall make room for it in our next.

The Rapids of the Jordan.

It had been ascertained that the Dead Sea was more than 1,000 feet below the level of the lake of Tiberias—as the distance between the two was but 60 miles. This would give a fall of about 20 feet per mile—greater, it was then thought, than any river in the world exhibited. The Mohawk river in America was held to be one of greatest fall, and that it averages not more than four or five feet to the mile; but it is now known that the Sacramento in California has a fall of 2,000 feet in 20 miles, or an average of 100 feet to a mile. It was then, however, thought that such a fall as it seemed necessary to suppose in the case of the Jordan, from the difference of level between the two lakes which it connected, was without example; and as its course was presumed to be tolerably straight, and as it was not know to contain any rapids, an error in the calculation of the difference of level between the two lakes was more than suspected. This problem it was left for Lieut. Lynch to set at rest. In the first place, the river is full of rapids. The boats plunged down no less than twenty-seven very threatening ones, besides a great number of lesser magnitude, and then, although the direct distance does, as stated, not exceed sixty miles, the course of the river is made at least two hundred miles by the exceedingly tortuous course of its stream. This reduces the fall to not more than six feet in the mile, for which the numerous rapids in the river sufficiently account.

"The descent by the river occupied no less than a week. So great were the difficulties caused by the rapids that in two days not more than twelve miles were accomplished; and on the third day, the wooden boat brought down from the Sea of Galilee was abandoned, on account of her shattered condition. None but metal boats could have stood the severe work of this passage. It was, nevertheless, made at the time of flood—at the season that the Israelites passed the river—and which, although the most unfavourable without boats, should be the most favourable with them. In fact, it is stated, that a few weeks earlier or later, the passage down the river in boats, would, as in the case of Lieut. Molyneux, have been impracticable, from the want of sufficient water to carry them over the rapids.

The wide and deeply depressed plain or valley (Ghor) through which the river flows is generally barren, treeless; and verdureless; and the mountains, or rather cliffs and slopes, of the river uplands, present, for the most part, a wild and cheerless aspect."

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TO CORRESPONDENTS.

"J. O. of N. Y."—We should like to see the carbonic acid liquid tested, to decide its economical value in the salt business, but we have doubts about it. The best kind is made by solar evaporation—this plan is largely pursued at Syracuse. The ink is different for printing, because it is mixed with oil or soap which prevents it from adhering like a dye to the paper.

"W. M., of N. Y."—Mr. Morse tried to print letters before he used his present mode but found that the plan now used by him was quickest, and this is our opinion also. We do not believe it would do so well; if you can make it work as fast—then you have got a valuable improvement, but the merit of it will stand or fall by this test. The Patent Office appears to be willing to grant a patent for any telegraph on the chemical side of the question.

"S. A. R., of Ala."—A case of drawing instruments can be purchased here for from $10 to $50. The highest priced ones are the cheapest in the end. Benj. Pike & Son, 166 Broadway, can supply you: we do not keep them for sale.

"C. J. T., of Ky."—Personally we are not interested in the rights of "Wood's Patent Shingle Machine," but communications in regard to it can be addressed to this office, as we see the owners every week. The machine gives good satisfaction to all who have used it, and the rights are fast being disposed of.

W. W. B., of R. I."—Your plan seems to be a very good one, but we cannot encourage you to offer it, as it is not probable that the enterprise can be carried into effect at present. A powerful opposition would manifest itself the moment it would be likely to succeed. The Common Council is the proper source to apply to.

"P. C., of Me."—It occurred several years ago; the project has never been revived, and will not be, in our opinion. It is entirely impracticable, and too expensive in the bargain.

"L. F. H., of Vt."—The drawing of your churn has been examined: it is entirely dissimilar to Mr. W.'s, and strikes us as being novel; but you could not obtain a valid patent, for the reason that you have had it in use too long.

"D. M., of Ohio."—Your letter has been handed over to the best engine builder in the city for attention.

"L. L., of Pa."—Since noticing Dr. Gesner's light we have received several letters in regard to it. We presume that Messrs. Walworth, Nason & Guild, 79 John street, will answer all letters sent to them, post paid.

"J. McC., of N. Y."—As soon as we receive advices from L. & J., in regard to the belting; the amount of your bill will be enclosed. We have furnished them with the substance of your letter.

"S. H., of Pa."—We do not think we shall be able to do anything with your discovery; applications of this kind are constantly being made to us, but we find no time from our other business to attend to them. You might advertise it through the papers

"M. & B., of Mich."—Your sample of wheat was received in fine order, and immediately forwarded to the Patent Office. You may look daily for the result of Mr. Carpenter's application.

"D. B. P., of S. C."—We were gratified to learn that your manufacturing enterprise has been so successful, and we are sincerely obliged to you for the fine list of subscribers you sent us. You understand the philosophy of success in business, it is apparent, and so long as you retain so many in your employ that appreciate and take the "Scientific American," your interests are safe. The agent of an other manufacturing establishment wrote us the other day, enclosing in his letter $20 for subscriptions, adding a note at the bottom that he considered the "Scientific American" as useful in his village as the use of lucubrating oil to his machinery—*i. e.*, either were indispensable.

"R. M. C., of N. Y."—Get an engraving published in the Sci. Am. It will be of immense benefit to you.

"B. A."—We are obliged to you for your article on Steam versus Water Power.

"L. L. M., of Mass."—The expences of a patent are indeed small in comparison with the benefits you will receive from it—be assured of that in your case.

"H. W. S., of N. Y."—The $2 received from you on the 6th inst., will pay up your subscription to No. 48, Vol. 6.

"G. S. G., of Pa., and J. M., of Del."—We have shipped each of you one of Alcott's Lathes, according to your directions. They were sent Aug. 7th.

J. E. L., of N. Y.; H. H. M., of Ill.; P. McK., of S. C., and D. M. G. of Me.—

Your specifications have been forwarded to your respective places for execution. Please follow the instructions which accompany each of your documents, and return the papers to this office as soon as executed.

Money received on account of Patent Office business, since August 1st, 1850:—

I. Z. A. W., of Phil., $37: A. & P., of Mass., $10; M. N., 2nd, of Pa., $40; T. R. of Conn., $15; A. C., of N. Y., $20; N. J. W., of Mass., $10; J. W. & Co., $45, and W. H. S., of Phila., $40.

Back Volumes Scientific American.

We are obliged to inform our patrons that complete sets of all the past Volumes are entirely exhausted.

Those desiring to secure Volume 5 but have delayed subscribing at first, are advised to remit $2 without delay or they may be disappointed in getting a volume at all, should they wait until the Nos. are all published?

Duggan's Work on Bridges.

Subscribers to Duggan's Work upon Bridges who have paid only $5, are notified that the balance of the subscription is now due. As Mr. Duggan has been subjected to a great expense in producing this valuable work, he would esteem it as a marked favor if the subscribers would be prompt in remitting for the completion of the Volume. Like many other co-laborers engaged in the field of extending useful publications. Mr. Duggan has not met sufficient encouragement to induce one of less determination than himself to go forward. His intention however is to complete the work, relying upon the generosity of the American Engineer for support, which we have no doubt in the end he will receive.

Sir Isaac Newton told Mr. Conduit that he had often heard his mother say that when he was born he was so little that they might have put him into a quart mug.

A sea-cow has been caught near Jupiter Creek, in Florida, which weighs 1,500 pounds. Barnum, it is said, has bought it.

Important Notice to us!

Whenever any of our friends order numbers they have missed—we shall always send them, if we have them on hand. We make this statement to save much time and trouble, to which we are subjected in replying, when the numbers called for cannot be supplied.

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One square of 8 lines, 50 cents for each insertion.
" 12 lines, 75 cts., " "
" 16 lines, $1,00 " "

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Patent Office.

128 FULTON ST.

NOTICE TO INVENTORS.—Inventors and others requiring protection by United States Letters Patent, are informed that all business relating to the procuration of letters patent, or filing caveats, is transacted at the Scientific American Office, with the utmost economy and despatch. Drawings of all kinds executed on the most reasonable terms. Messrs. Munn & Co. can be consulted at all times in regard to Patent business, at their office, and such advice rendered as will enable inventors to adopt the safest means for securing their rights.

Arrangements have been made with Messrs. Barlow and Payne, Patent Attornies, in London, for procuring Letters Patent in Great Britain and France, with great facility and dispatch.

MUNN & CO.,
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TO IRON FOUNDERS, &c.—Fine ground and bolted Sea Coal, to mix with moulding sand, an approved article ground from selected lump; Charcoal Foundry Blacking; Bolted Lehigh, Soapstone, Black Lead Foundry Facing; also Fire Clay, and Iron and Brass Founder's superior Moulding Sand, in barrels, for sale by G. O. ROBERTSON, New York. City Office 4 Liberty Place, Maiden Lane, near the Post Office. 47 4eow

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AMERICAN AND FOREIGN PATENT AGENCY.

WE WOULD remind our numerous friends throughout the country, that we still continue to conduct the business of procuring Letters Patent for new inventions in this and all foreign countries, where the right is recognized Since making arrangements with those eminent attorneys, Messrs. Barlow, Payne & Parken, Editors of the London Patent Journal, we have secured and managed through them, several foreign applications, with the utmost economy and facility. Inventors and others, desiring advice upon this subject, can correspond confidentially with the Editors of this paper.

PATENT ROCK DRILLING MACHINE—The celebrated Rock Drilling Machine, invented by Messrs. Foster & Bailey, of this city, and described with an engraving on page 153 of Vol. 3 of the Scientific American; is now offered for sale in rights to suit purchasers. The machine has been thoroughly tested upon all kinds of rock, and its superiority over every other drilling machine that has yet been invented, must be apparent to every one who has had experience in using machines for this purpose. A silver medal was awarded to the inventors by the American Institute, and while it was exhibiting at the Fair for a few days, it attracted crowds to witness its simple but successful operation. A model of the machine, with the "Silver Medal," may be seen at the Scientific American Office, and any letters of enquiry concerning the purchase of rights may be addressed, (post-paid) to MUNN & CO.

P. S.—A valid patent is secured on the above, and the public are cautioned not to infringe the claims.

Patent Rights for sale for any State, county, or section, and working drawings furnished to the purchaser. 47tf

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2	-	-	470	12-0	-	-	721
2	-	-	944	14-0	-	-	——
2	-	-	581	15-0	-	-	710
2	-	-	66	6-6	-	-	——
2	-	-	83	4-10 1-2	-	-	——
2 1-4	-	-	356	15-0	-	-	245
2 1-2	-	-	252	15-0	-	-	210
2 3-4	-	-	150	15-0	-	-	200
3	-	-	—	15-0	-	-	160
4	-	-	28	15-0	-	-	18
5	-	1	1	15-0	-	-	——
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Scientific Museum.

For the Scientific American.

Astronomy--Saturn's Ring.

The appearance of Saturn is unparalled in the solar system. He is a spheroid 1000 times larger than the earth, surrounded by a ring brighter than himself. This ring is 204,883 miles in diameter and 100 in thickness, and rotates from east to west about the planet in ten hours and a half. Hence a point on its surface moves at the rate of 100 miles per minute, 58 times swifter than the earth's equator. According to Bessel, its mass is equal to the 18th part of that of the planet. Each side has alternately 15 years of sunshine and 15 of darkness. The oblateness of the planet and the flatness of the ring act on each other like two magnets, so as to adjust each other's motions. Several astronomers have travelled beyond the precincts of their science to account for its formation. Maupertuis maintained that this luminous girdle was the tail of a comet. Mairan asserted that the exterior shell of Saturn (originally equal to the diameter of its outer ring,) broke in pieces, and, the equatorial parts of the exterior shell remaining entire, thus formed a ring. Buffon imagined it to be a part of the equator, detached by the excess of centrifugal force. La Place thought it a fluid zone, abandoned by its atmosphere. The ring was first observed by Galileo. Fearing piracy, he announced his new discovery enigmatically, (a practice then common,) and invited all astronomers to declare if they had noted anything new in the heavens. The transposed letters he published were—

"Smaismrmilme poeta leumi bune nugttaviras."

Kepler, in the spirit of his riddling philosophy, endeavored to decypher the meaning, and fancied he succeeded when he formed a barbarious Latin verse—

"Salve umbistineum geminatum Martia proles,"

thinking it related to Mars. At the request of the Emperor Rodolph, Galileo sent him the real reading—

"Altissium planetam tergeminum observavi;"

i. e., "I have observed that the most distant planet is triple," and constituted in this form, oOo. But it was reserved for Huyghens, in 1656, to declare to the world that these supposed attendant stars are in fact part of a ring. This he did by an anagram :—aaaaaaa ccccc d eeeee g h iiiiiii llll mm nnnnnnnnn oooo pp q r s ttttt uuuuu, which he afterwards recomposed into the sentence,—"Annulo cingitur, tennui, plano, nusquam, cohaerente, ad eclipticam inclinato;" *i. e.*, "He is surrounded by a ring, slender, flat, in no place touching him, inclined to the ecliptic." J.W.O.

Climate.

Acosta is the first philosopher who endeavored to account for the different degrees of heat in the old and new continents by the agency of the winds which blows in each. This theory Buffon adopted. The probable cause of the superior degree of cold towards the southern extremity of America seems to be the form of the continent. Geologists infer that during the deposition of the older fossiliferous rocks the climate was ultra-tropical, *i. e.*, warmer than at present exists on the globe.—Agassiz, Lyell, and Smith have proved that the climate of northern regions, immediately preceding the alluvial period, was lower than it is at present: and it is the opinion of the first that a similar fall of temperature took place near the close of each great geological period.

Moon.

Plutarch says that the Pythagoreans believed the moon to have inhabitants fifteen times as large as men, and that their day is fifteen times as long as ours.

The six regular geometric solids are, the cube, sphere, tetrahedron, octohedron, dodecahedron, and icosahedron; by means of which, Kepler endeavored to assign a reason why there are *six* planets.

Theory, said Leonardi da Vinci, is the general, and Practice the soldiers.

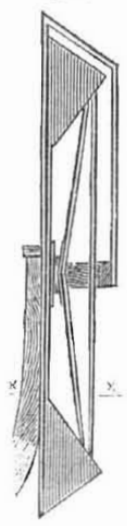
History of Propellers and Steam Navigation.

[Continued from page 368.]

RENNIE'S EXPERIMENTS.—(CONTINUED.)

FIG. 75.

(Improved Triangular System, when the vessel is upright.)



In connection with the forms of the paddles presented in our last, we here present two more, with Mr. Rennie's description of the same :—

A series of experimeats on two other vessels was again made in the years 1839, 1840, and 1841, by applying different shaped floats to paddle wheels of different diameters and widths —and on steam vessels of different powers of from 6 to 90 horses, an abstract of some of which was published in 1840.

The following were the particulars of the "African" when tried in 1837, previous to her being tried in 1841 :—

Length between perpendiculars,	109 ft.	11 in.
Extreme breadth, - -	24	10
Mean draught, - - -	9	4⅛
Depth, - - - -	10	0

Nominal power of engines (by Maudslays and Field) 45 horses, or 90 horses together.

Number of strokes made by the engine per minute, 20 to 30.

Barometer guage, 24 to 26¾ inches.

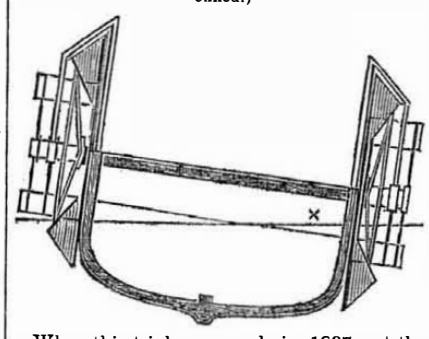
Area of immersal midship section, 150 square feet.

Mean diameter of the paddle wheels, 14·7.

Area of the immersal rectangular floats, on the cycloidal or Galloway system, twelve in number, 7 feet in length, and 1 foot 9 inches in breath; thus presenting an area of from 57 to 60 square feet, being a ratio of 1 foot of float to 1·6 midship section.

FIG. 76.

(Improved Triangular System, when the vessel is inclined.)



When this trial was made in 1837, at the measured mile in Long Reach, her average speed of six trials each was 9·174 statute miles per hour with her rectangular floats.—Subsequently, she was employed for towing and other purposes, and had never undergone any other repairs than in her engines, and had never been in dry dock; her bottom was consequently foul and covered with green weeds, when tried with the trapezium floats in 1841.

Experiments on H. M. Steamer "African," with Trapezium Floats :—All the rectangular floats, twelve in number on each wheel, were removed, and twelve trapezium floats were fixed to the interior and middle rings of each wheel. X X is the water-line.

Thus making the area of the immersed floats 34 square feet.

Number of revolutions made by engines, 23½ per minute.

Mean speed of vessel in statute miles, 9·1.

Mean diameter of wheels, 17 feet.

Comparing the whole of the experiments, when tried in still water under the most favorable circumstances, and when tried in the "African," under the unfavorable circumstances of foul bottom and difference of the powers of the engines, the conclusion is in favor of the trapezium floats. The truth of the principle is confirmed by Mr. Ewbank, and by the laws which govern the forms of the tails of fishes, the feet of aquatic birds, and the wings of birds and insects, whereby the means are so admirably suited to the ends; and the triangular form proposed by Mr. Ewbank for paddle floats entirely confirms the view I took of the the subject in the years 1839 and 1840.

To Color Nankeen.

Nankeen is a cotton cloth of a beautiful color, which derives its name from Nankin, in China, from which place it was first brought to Europe. Many suppose that true Nankeen is artificially colored, but this is not so; its color is that of the natural cotton—a peculiar kind, some of which has been successfully cultivated in Georgia. The color of nankeen may be imitated in the most perfect manner, and in every case linen drill of this color, may be set down as an artificial production.

In the first place, let us say, every planter should have a washing house with a chemical drug-room close at hand, and every farmer should have the same thing. A small dye-house should also be attached, containing one or more boilers, a plentiful supply of water, tubs, &c., and a good drain to carry off the waste water. Every agriculturist should endeavor to acquire an extensive knowledge of practical chemistry. We know of no science superior to this for expanding the mind.

To produce light nankeen shades, the cotton cloth should be first bleached white. This can be done by having some of the chloride of lime dissolved in cold water in a tub, using the clear hot, and handling the cloth in it till it is white, then handling it in a clean water, made sour to the taste, in a tub, by vitriol, and afterwards washing it well. It is then fit to be dyed; to do this, dissolve one pound of copperas in half a gallon of water, and dissolve two pounds of quick lime in 10 gallons of water; then let both solutions settle. Pour off five gallons of the clear lime water into a tub of clean cold water, sufficient to cover the cloth, and allow it to be handled by the selvage freely. Then into another tub of cold water, about the same size as the lime water tub, put in one quarter of the clear dissolved copperas. (Although it is a little more expensive, one ounce of the nitrate of lead should be dissolved with the copperas.) Now handle the cloth well for five or ten minutes in the lime, giving it three selvages from end to end, and afterwards wring and shake it. It is now to be handled the same way in the copperas solution, then wrung and aired for ten minutes. It is then to be put through the lime and copperas in the same manner, adding enough of the strong lime and copperas to make three successive dips, airing well out of the copperas every time. It is then put through, last, a clean tub of lime water, which can be made by putting more clean water among the two lbs. of lime, letting it settle and using the clear. It is then well washed in water, then in a strong solution of soap, and afterwards well washed, then dried. This will also dye unbleached cotton cloth, which will be somewhat darker in the color. The quantities of lime and copperas given, will dye 30 yards of common cloth. Light and dark shades are produced by the quantity of lime and copperas used, and the number of dips given. The eye will judge the depth of color desired. Unbleached cotton cloth, should be boiled for about one hour in lime water, then washed well before it is dyed.

Bleached goods sold in stores are difficult to color level—they always *spot*, owing to some chloride of lime not being thoroughly washed out of them. The only remedy for this is to steep the cloth all night in warm water, then boil it in lime water, and wash it well before it is dyed, (and it would be all the better to be quickly handled in hot water, made sour with vitriol, and then well washed.) By pursuing the process laid down, any person may color his own *nankeen*. This color washes well in strong soap suds, but it spots brown and black, if tea, coffee, or any solution containing galic acid, gets on it. If the nitrate of iron (clean iron dissolved in nitric acid) is used in place of the copperas, a much richer color is the result, but a somewhat more expensive one.

There are two other processes for dyeing this color, which we will explain next week.

According to Hembel, a horse-hair, if pushed down a narrow tube of glass, so as to make its end rub the side, will cause it to break on the application of a high temperature, even the heat of the hand will be sufficient in cold weather.

The longest day in Patagonia is the 21st of December.

NEW PROSPECTUS OF THE SCIENTIFIC AMERICAN.

TO MECHANICS, INVENTORS, AND MANUFACTURERS.

The Publishers of the SCIENTIFIC AMERICAN respectfully give notice that the SIXTH VOLUME of this valuable journal will be commenced on the 21st of September next, offering a favorable opportunity for all to subscribe who take an interest in the progress and developement of the Mechanics' Arts and Manufactures of our country. The character of the SCIENTIFIC AMERICAN is too well known throughout the country to require a detailed account of the various subjects discussed through its columns.

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Any person sending us three subscribers will be entitled to a copy of the "History of Propellers and Steam Navigation," re-published in book form—now in press, to be ready about the 1st of October. It will be one of the most complete works upon the subject ever issued, and will contain about ninety engravings

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